

Patent Claims

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1. Device for atomizing liquid samples for spectroscopic measurements, comprising a tubular furnace which has a flame-heated tube (6), and with an arrangement for introducing a sample into the tube (6), characterized in that there is a sample inlet opening (7) in the tube (6) to which a capillary (8) leads, the capillary (8) is flame-heated at its end facing the tube (6) along with the tube (6), and a pump is provided for delivering a sample through the capillary (8), wherein the sample is partially or completely evaporated in the capillary (8) acting as thermospray and flows into the tube (6) in this state.

2. Device according to claim 1, characterized in that the capillary (8) and the tube (6) are fixedly connected mechanically with one another.

3. Device according to claim 1 or 2, characterized in that the capillary (8) is connected with an additional heating source.

4. Device according to one of the preceding claims, characterized in that the burner head (2), tube (6) and capillary (8) are positioned with respect to one another in such a way that the tube (6) is heated along its entire length and the capillary (8) is heated at its end facing the tube (6).

5. Device according to one of the preceding claims, characterized in that the capillary (8) is constructed with an inner diameter of between 0.02 mm and 2 mm.

6. Device according to one of the preceding claims, characterized in that the capillary (8) comprises an extensively chemically resistant and temperature-resistant metal, an extensively chemically resistant and temperature-resistant metal alloy, ceramic and/or silica glass.

7. Device according to one of the preceding claims, characterized in that the capillary (8) is constructed cylindrically and has an inner cylinder jacket comprising ceramic or silica glass and an outer cylinder jacket comprising metal or a metal alloy.

8. Device according to one of the preceding claims, characterized in that the flame-heated tube (6) of the tubular furnace comprises an extensively chemically resistant and temperature-resistant metal, an extensively chemically resistant and temperature-resistant metal alloy, ceramic and/or silica glass.

9. Device according to claim 8, characterized in that the flame heating is carried out by means of a burner head (2) which is constructed as a slit burner.

10. Device according to one of the preceding claims, characterized in that the pump is constructed as a continuously pumping peristaltic single-channel or multichannel pump (10, 17), as a gas pressure pump (26), piston pump (35) or diaphragm pump.

11. Device according to claim 10, characterized in that a diaphragm pump is provided with a pulsation damper.

12. Device according to one of the preceding claims, characterized in that a sample feed device in the form of a manual sample feed valve (18) or a sample changer (23) with an automatic sample feed valve (24) is arranged between the pump (17, 26, 35) and capillary (8).

13. Device according to one of claims 1 to 11, characterized in that a sample changer (15) is provided on the suction side of the pump (10).

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14. Device according to claim 12 or 13, characterized in that a partition column or enrichment column (36) is arranged between the sample feed device and the capillary (8).

15. Device according to one of the preceding claims, characterized in that the flame-heated tube (6) of the tubular furnace has, besides the sample inlet opening (7) and two end openings (37), at least one additional opening (38) which is oriented in the direction of the burner slit (3).

16. Device according to one of the preceding claims, characterized in that the flame-heated tube has, besides the sample inlet opening (7) and two end openings (37), at least one additional opening (39) facing away from the burner slit (3).

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